

BEAMS DIVISION DEPARTMENTAL PROCEDURE
ELECTRICAL/ELECTRONIC SUPPORT DEPARTMENT

BDDP-EE-4923

EQUIPMENT SPECIFIC LOCKOUT/TAGOUT PROCEDURE

FOR THE C-0 SHUNT POWER SUPPLY AT B4

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ISSUE DATE: 1/29/03

REVIEW AND CONCURRENCE RECORD

REVIEWED BY Julius Lentz DATE 1/29/03
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1.0 PURPOSE AND SCOPE

The purpose of this Beams Division Departmental Procedure (BDDP) is to outline and detail the conduct of LOCKOUT/TAGOUT (LOTO) for the maintenance of the C-0 SHUNT Power Supply. The Power Supply consists of a FET bank, a resistor bank and a 120 Amp bias supply. It is directly connected to the Tevatron Bus, which is a source of potential hazard.

2.0 AUTHORIZED PERSONNEL

A Beams Division employee is authorized to perform this LOTO procedure if he/she has the necessary knowledge and current training in electrical safety, has read and understands this LOTO procedure, possesses the requisite knowledge with respect to high power electronic equipment.

The EE Support Department Head maintains a list of department personnel authorized to perform this procedure. This list is accessible on the web via the department's home page under "LOTO Compliance".

In times of emergency the Department Head or the Power Supply Group Leader may authorize other employees to perform this procedure. They shall assure themselves that the employee has read this procedure and can safely perform the necessary activities.

3.0 THE NECESSITY OF WRITTEN LOTO PROCEDURE

Written LOTO procedures apply to the C-0 Shunt Power Supply because of the hazards associated with being connected to the main Tevatron Bus.

4.0 THE STEPS OF LOCKOUT/TAGOUT PRIOR TO MAINTAINANCE ACTIVITY

4.1 Prepare: The authorized employee shall understand the hazards involved and how to control them. **Safety Glasses shall be worn at all times while performing this procedure. The two-man rule shall apply at all times maintenance work is performed on this equipment**

4.2 Notify: The authorized employee should, as necessary, notify affected area personnel of the LOTO maintenance activity. Affected personnel include those who might normally use the equipment or would be affected by the unavailability of the equipment. It may be necessary to notify the Crew Chief in the Main Control Room (Ext. 3721).

4.3 Shutdown:

4.3.1 Halt the Tevatron Ramp.

4.3.2 Turn OFF all Tevatron VCB's.

4.3.3 Get a Tev PS key from the crew chief and bring it to B4 service building.

4.4 Isolate: The authorized employee shall isolate the equipment from its energy sources

4.4.1 Isolate the 120 VAC power from the rack by doing the following:

4.4.1.1 Observe the lit 120VAC indicator bulb on the rack front panel.

4.4.1.2 LOTO the 120 VAC Safety Switch labeled C0SHUNT.

4.4.1.3 Verify that the 120 VAC has been isolated by observing that the indicator bulb is now OFF.

4.4.2 Use Tev PS key to open the back door of rack # B416.

4.4.3 Open cover of knife switch enclosure.

4.4.4 Use TESTED voltmeter to assure there is no voltage on the knife switch terminals with respect to cabinet ground.

4.4.5 Open the knife switch.

4.4.6 Close and LOTO the knife switch enclosure door

The equipment is now locked out. Service or maintenance activity may now begin.

5.0 SHIFT AND PERSONNEL CHANGES

A lead authorized employee shall ensure that Lockout/Tagout procedures are followed when the C-0 Shunt Supply enclosure is locked out over a shift or personnel change. This same lead authorized employee shall ensure:

- 5.1 That no unauthorized lock and tag removals have taken place
- 5.2 An orderly exchange of locks and tags from off-going to on-coming employees
- 5.3 An orderly transfer of responsibility and information about the equipment status from the off-going to on-going shift.

6.0 THE FIVE STEPS FOR RETURN TO SERVICE

The authorized employee must perform the following steps prior to returning the equipment to service after maintenance activity.

- 6.1 **Check Equipment:** Check the equipment and the immediate area around it to ensure that nonessential items and tools are cleared and that the equipment is ready for safe operation.

- Check high current components and all high current connections for tightness and integrity.

- 6.2 **Check Work Area:** Check the work area to ensure that all employees are safely positioned or removed from the area as necessary and/or appropriate.

- 6.3 **Verify:**

- 1. Verify that you have a Tev PS key in your possession.
 - 2. Open knife switch enclosure .
 - 3. With TESTED voltmeter, verify that there is no voltage on knife switch inputs with respect to cabinet ground.
 - 4. Close knife switch.
 - 5. Store lock and tag on floor of knife switch enclosure.
 - 6. Close knife switch enclosure door. Do NOT padlock.

- 6.4 **Remove Padlocks and Tags and Re-energize:**

- 1. Close and lock all doors on the C-0 Shunt Supply enclosure.
 - 2. Remove Lock from the Safety Switch labeled C0SHUNT and energize.
 - 3. Return Tev PS key to the MCR.

- 6.5 **Notify:** The authorized employee should, as necessary, notify affected area personnel of the completion of maintenance and LOTO activity. If the Crew Chief in the Main Control Room was notified prior to the activity, he/she should be notified of the completion of the activity.

This completes the requirements for returning the Power Supply to service.

7.0 PROCEDURE TRAINING REQUIREMENTS

Authorized employees are required to have had LOTO training (Level 1 and Level 2), and have read and understood this LOTO procedure.

Electrical/Electronic Department Personnel using this procedure shall be trained on the job. After reviewing this document, the employee shall perform the steps accompanied by an employee with previous experience. The authorized employee shall then complete a "Beams Division Electrical/Electronic Department Procedures Review Form" and turn it in to the department secretary.

Personnel from other departments shall be trained according to the requirements of their department.